Halton-Hamilton Source Protection Region

DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER

The Carlisle Well Field

The municipal drinking water system for Carlisle is included in the Halton-Hamilton Drinking Water Source Protection project under the Ontario *Clean Water Act, 2006*.

Source protection is the first step toward safeguarding our drinking water, followed by adequate treatment, safe distribution and regular testing. Protecting sources of drinking water – whether groundwater or the lake – eases the strain on costly treatment processes and reduces the need to find alternate sources.

Carlisle water tower

The Carlisle municipal system is owned and operated by the City of Hamilton. It uses four wells – FDC01, FDC02, FDC03R and FDC05 - to extract groundwater to service about 600 homes and businesses. The wells were constructed between 1971 and 2006. They extend to a depth of 40 metres and tap into a bedrock aquifer.

Drinking water quality
to preserve and protect

A wellhead protection area (WHPA) is the surface area under which water flows through an aquifer to a pumping well. WHPAs are mapped to identify the areas to be protected. Existing and potential activities that could contaminate the groundwater supplying municipal wells have been listed.

A calibrated groundwater flow model is considered one of the best science-based methods for identifying wellhead protection areas and determining the vulnerability of the area to contamination from activities. A groundwater flow model developed for the City of Hamilton was used to assess the Carlisle municipal well field.

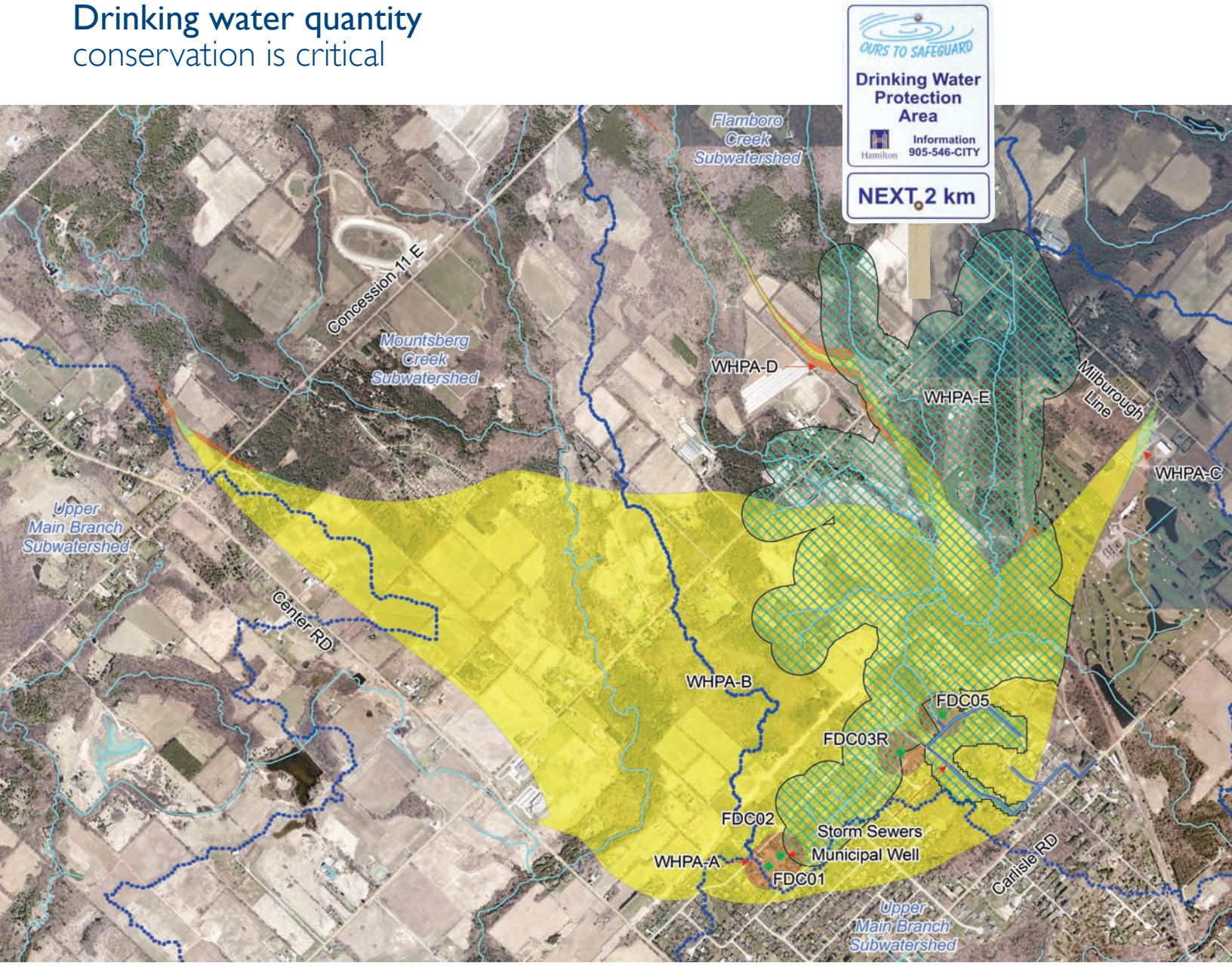
The level of risk to the water quality at a well reflects the time it takes for a contaminant to travel to the well and the time for authorities to react. Because the four municipal wells in Carlisle are close together, their wellhead protection areas overlap to form one large area. This wellhead protection area is divided into the following parts.

- WHPA-A – an area of 100 metre radius around the wellhead
- WHPA-B – the zone through which it takes groundwater up to two years to reach the well
- WHPA-C – the zone through which it takes groundwater two to five years to reach the well
- WHPA-D – the zone through which it takes groundwater five to 25 years to reach the well
- WHPA-E – an area of surface water that could directly influence the well water quality

The source water for two of the Carlisle wells, FDC03R and FDC05, is considered to be under the influence of surface water. Flamboro Creek drains the area in which these wells are located. A storm sewer network also drains a residential subdivision to a stormwater management pond located adjacent to FDC05. This pond drains to a tributary of Flamboro Creek. The flows within the creek and the storm sewer were assessed as a WHPA-E, a protected area within a 2-hour time of travel.

Based on the results of groundwater and treated water analyses between 1999 and 2008, as measured at the Carlisle well supply, no drinking water issues have been identified. The quality of the source water is good and the treated water meets the provincial standards.

Drinking water quantity
conservation is critical



The City of Hamilton holds two Permits To Take Water (PTTW) that allow the taking of up to 851 cubic metres per day from wells FDC01 and FDC02, up to 2,160 cubic metres per day from FDC03R, and up to 1,296 cubic metres per day from FDC05. The operators manage the water takings to maintain a sustainable supply at much less than permitted rates. In 2009, the Carlisle wells pumped a total of 305,113 cubic metres of water.

The Carlisle water takings are the highest per capita of the municipal water supplies in the Halton-Hamilton Source Protection Region. The variation in water takings from month to month is often significant – as much as a 550 percent difference between the low water takings in the month of February and the high water takings in July. This variation in monthly demands on the groundwater resources can result in summertime stresses.

The Carlisle wells are located in the Flamboro Creek subwatershed, part of the Bronte Creek watershed that drains to Lake Ontario. Surface water and groundwater stress assessments, completed for the year 2007, compared the supply and the demand on water resources. Users of water in the subwatershed include

Carlisle water treatment plant

municipal, domestic, agriculture and a golf course. Based on the assessment completed, the current surface and groundwater needs can be managed within the Flamboro Creek subwatershed, as long as conservation is practiced by all.

Drinking water threats

The Ministry of the Environment and Climate Change has legislated specific activities as drinking water threats at low, moderate and significant levels. Significant threats are addressed through policies in the Source Protection Plan.

There are 19 prescribed drinking water threats to water quality. They are related to

1. Waste disposal sites – their establishment, operation or maintenance
2. Sewage systems – their establishment, operation or maintenance
3. Agricultural source material – application to land
4. Agricultural source material – storage
5. Agricultural source material – management
6. Non-Agricultural source material – application
7. Non-Agricultural source material – handling and storage
8. Commercial fertilizer – application
9. Commercial fertilizer – handling and storage
10. Pesticide – application
11. Pesticide – handling and storage
12. Road salt – application
13. Road salt – handling and storage
14. Snow – storage
15. Fuel – handling and storage
16. Dense non-aqueous phase liquid – handling and storage
17. Organic solvent – handling and storage
18. Chemicals used to de-ice aircraft – management of runoff
19. Land associated with livestock – for grazing, or confinement such as a feedlot.

There are also two prescribed threats that relate to water quantity.

1. An activity that reduces the recharge of an aquifer.
2. An activity that takes water from an aquifer or a surface water body without returning the water taken to the same aquifer or surface water body.

Potential or existing activities assessed as significant threats in the Carlisle wellhead protection area include

- Sewage systems
- The application of agricultural source material
- The application of pesticide
- The use of land for livestock grazing and pasturing, and as confinement yards.

There are no existing water quantity threats identified for the Carlisle well field.

Inside the water treatment plant

For more information about Drinking Water Source Protection in the Halton-Hamilton Region, please visit our website www.protectingwater.ca. The site contains a wealth of information including advice about how you can ask questions and become involved in the Halton-Hamilton Source Protection project. We encourage you to do so.

You may also call us at 905-854-9229 ext. 223 or reach us by email at **sourceprotection@hrca.on.ca**

Conservation Halton

Ontario

This project has received funding support from the Government of Ontario.

Hamilton Conservation Authority

Healthy Streams...Healthy Communities!

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ACT FOR CLEAN WATER